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High School Graduation and Career-Technical Education Program Completion: A Status Report to the State Board of Education

By: *SESRC – Puget Sound Division*
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EXECUTIVE SUMMARY

In response to an assignment by the Washington State Legislature (RCW 28A.230.090), the State Board of Education (SBE) contracted with the Social and Economic Sciences Research Center – Puget Sound, Washington State University (SESRC) to investigate the degree to which Washington high school students continued to complete rigorous programs in Career and Technical Education (CTE). SESRC examined student data from 2005 and 2006 to learn whether expanded graduation requirements hindered students from completing CTE programs and earning industry certifications.

KEY FINDINGS

1. Students leaving high school in 2006 were very similar to those who left in 2005. Slightly more students and graduates were in special education and poor, but the changes were small.
2. Overall, the general characteristics of CTE completers largely matched those of all students. One exception was that CTE completers were slightly less likely to graduate on time (88.7% of CTE completers graduated on time vs. 93.7% of non CTE completers).
3. The graduation rate rose slightly from 2005-2006, but CTE completers increased by 1.5% from 2005-2006. CTE completers who graduated increased by 3.6% and the proportion of all students left school who were both CTE completers and graduates rose by 1.9%. Statewide, CTE enrollment declined in the years studied (2005 and 2006).
4. CTE completers' schools were slightly more often urban and slightly less often rural than their peers.
5. CTE completers also varied widely in their rate of meeting standards on the WASL when grouped by their CTE program clusters.
6. There were no program completers in one cluster in either year: Government and Public Administration. It should be noted that jobs in this cluster compose 10.2% of Washington's economy.
7. The greatest changes in CTE appeared in the number of CTE completers among programs. Although equal numbers of career clusters gained students as lost them (7 each, with 2 unchanged), many of the changes were dramatic. For example, Hospitality and Tourism, a relatively small program statewide, grew by 40%. Manufacturing, a traditional CTE mainstay, declined by 11%. Some changes were likely due to changes in course coding or program organization. Overall, however, the significant changes could cause very different educator perceptions of the state of CTE, depending on the program under consideration.
8. The number students earning industry certifications increased substantially (up 43.7%). Interestingly, the proportion of students earning industry certifications without completing a CTE program increased at an even greater rate.
9. Washington has a strong tradition of Tech Prep, enhanced by the dual credit policies of the state. Tech Prep program completion continues to rise (up 2%).

10. While students from all CTE programs had substantial student employment, rates of employment varied widely, as did college attendance. And programs differed fundamentally by how many of their students required remediation in postsecondary education, as indicated by the rates of remediation for students who completed CTE programs in various clusters.

CONCLUSION

Overall, CTE in Washington looks strong when viewed in the aggregate, but is clearly undergoing considerable changes in some programs and some districts. Local views may seem quite different from the state-level picture. This likely parallels the changes occurring throughout K-12 education as reform continues. The information provided here may help us know what remains strong and what needs our focused attention to ensure that CTE continues to help students prepare for the careers that lie ahead.

High School Graduation and Career-Technical Education Program Completion: A Status Report

BACKGROUND

All secondary educators share the same goal: students prepared for successful lives after high school. For all students, that means mastering the fundamental skills of reading, writing and mathematics needed by all adults. In addition, for many students that means strong preparation for college. For others it means equally important preparation for employment. For most students, it means both. Washington recognized the dual importance of academic and career preparation in its education reform legislation. For Washington to reach its avowed goals, students must be able to prepare fully for both eventualities. Further, the rising economic importance of the high school diploma means that students must not be forced to choose between successfully completing high school and adequately preparing for a career.

During the 2006 session of the Washington Legislature, concern again arose regarding the potential effect of the state's education reform requirements on students' ability to complete rigorous, high quality programs of career preparation. Just as the state has endeavored for several years to improve students' academic performance, Career and Technical Education (CTE) educators have been working to increase the technical skills taught in their programs. Concerns about how well schools are managing both assignments simultaneously gave rise to this study.

As a result, the Legislature directed the State Board of Education (SBE) to "reevaluate the graduation requirements for students enrolled in vocationally intensive and rigorous career and technical education programs, particularly those programs that lead to a certificate or credential that is state or nationally recognized. The purpose of the evaluation is to ensure that students enrolled in these programs have sufficient opportunity to earn a certificate of academic achievement, complete the program and earn the program's certificate or credential, and complete other state and local graduation requirements." (RCW 28A.230.090)

STRUCTURE OF THE REPORT

This report contains three sections. This first section provides context and background, a description of the study, and a summary of the research questions and key findings. The second section provides more detail about the data that supports each key finding, and graphically depicts the results. The third section is an addendum that synthesizes a brief history of career and technical education in the state.

THE STUDY

Given the limitations of student time, teacher supply, and acceptance by peer educators and parents, CTE educators and advocates are concerned that the state's commitment to

CTE education is wavering. Some CTE teachers report substantial erosion of their programs.

To test those concerns, the SBE contracted with the Social and Economic Sciences Research Center-Puget Sound, Washington State University, to investigate data for students leaving school¹ in 2005 and 2006 to compare the characteristics and outcomes of students who had completed CTE programs with those who had not. The study also investigated characteristics of the schools where CTE programs operate, and the students who complete CTE programs, to identify correlations that might illuminate changes in CTE program completion.

Why Focus on Program Completion? Washington state policy requires that all high school students complete at least one credit in occupational education. Fifty-four percent (54%) of the 246 districts with high schools require students to take two or more credits. Therefore, merely measuring how many students take CTE courses or earn occupational education credits would not tell us much about student or educator choices.

The study focused on students designated as “CTE program completers,” which meant they had completed 360 hours of related CTE coursework. We thought the characteristics of these students would provide a clear representation of students committed to CTE.

What Other Measures Were Reviewed? The study also investigated the rate at which students completed Tech Prep programs and earned industry certifications.

Who Was Included in the Study? The study analyzed two cohorts of students, based on when they left school by graduation or dropped out. The most recent years for which compiled data were available were 2004-2005 and 2005-2006. For students leaving in 2005, data was also available on work or college after high school, and on remedial courses among those in college.

What Information Was Collected About Schools? Since students often reflect and are affected by the characteristics of the school and community around them, the study identified schools by size, rate of WASL passage, percentage of students on Free and Reduced Price Lunch, and whether they were urban or rural.

STUDY QUESTIONS AND FINDINGS

Following is a list of the initial research questions, some of the answers found, and other key findings that emerged from the data.

¹ Note: These cohorts are not the same as “class of 2005” and “class of 2006” because we included all students who left high school in those years. This includes students who graduated “late”, meaning later than the year first coded as their anticipated year of graduation. It also includes students who graduated earlier than originally anticipated. Students who are still enrolled in school beyond the date of their anticipated graduation are not characterized here. They would be included in the cohort of the year they actually graduate (or leave school).

Research Questions and Answers. Since Washington requires students to take one credit in occupational education, we wanted to know about the students who choose to participate more in CTE – who commit to career preparation and complete a CTE program.

- **Are students who complete CTE programs somehow different from their peers?** We found that they were not. In fact there was only a slight under-representation of Asian students (2%) and slight over-representation of Hispanic and white students (1% each) among the students who completed CTE programs.

We wanted to know if the number of students completing CTE programs was declining.

- **Over the two years of the study, were there any changes in the number of students completing CTE programs?** We found that the proportion of students completing CTE programs actually increased from 2005 to 2006, although overall CTE enrollments declined. That would mean there were fewer students taking CTE courses in total, but that the proportion of students who committed to completing a CTE program remained strong and actually rose.

Although the students studied were not yet required to pass the 10th-grade Washington Assessment of Student Learning (WASL) in order to graduate, they were attending high school with students subject to that requirement. All students took the WASL, as their classes and districts adjusted to the demands of education reform.

- **In 2006, with only two years to go until full implementation of new graduation requirements, were students finding it possible to complete CTE programs and graduate?** We found that just as a slightly higher proportion of students completed a CTE program in 2006, the proportion of students who both completed a CTE program and graduated increased from 2005 to 2006. We also found, however, that overall CTE completers were slightly more likely (5%) than their peers to graduate late.

We also wanted to know if there was anything different about the schools in which many students complete CTE programs.

- **Were more CTE program completers going to high school in high-income districts? Were they more rural than urban?** Both the largest proportion of all students leaving school in 2006 and the largest proportion of CTE program completers had attended districts in which 25 – 49% of the students qualified for free and reduced price lunch (FRPL), a common measure of poverty. In contrast, 3.8% more CTE students attended districts with 50-79% of the students qualified for FRPL than did all graduates. The CTE students were also 1.9% more likely than other graduates to attend an urban district.

Finally, we wanted to know what careers were attracting CTE completers.

- **For what careers were they preparing?** We found wide variations in CTE program completers when grouped by their career clusters. Several traditional CTE programs, such as Manufacturing, demonstrated significant declines, while other programs showed considerable growth. Hospitality and Tourism, while a small program overall, appears to benefit from the popularity of the Culinary Arts programs in that cluster.
- **How well prepared were they for college, as indicated by their placement in pre-college English or math?** The information for students who left high school in 2005 indicated significant variation among programs by cluster. CTE programs intend to prepare students for postsecondary education and training, as well as employment. The rates at which CTE program completers entered 2-year and/or 4-year colleges differed greatly. Rates of employment were varied, though strong overall. (These included students working and attending college.) And, while each year a substantial number of all Washington high school graduates are not qualified for college-level math or English when they first enter college, the remediation rates for CTE students differed greatly among clusters.

Key Findings. The following list summarizes the key findings from the study.

1. Students leaving high school in 2006 were very similar to those who left in 2005. Slightly more students and graduates were in special education and poor, but the changes were small.
2. Overall, the general characteristics of CTE completers largely matched those of all students. One exception was that CTE completers were slightly less likely to graduate on time (88.7% of CTE completers graduated on time vs. 93.7% of non CTE completers).
3. The graduation rate rose slightly from 2005-2006, but CTE completers increased by 1.5% from 2005-2006. CTE completers who graduated increased by 3.6% and the proportion of all students left school who were both CTE completers and graduates rose by 1.9%. Statewide, CTE enrollment declined in the years studied (2005 and 2006).
4. CTE completers' schools were slightly more often urban and slightly less often rural than their peers.
5. CTE completers also varied widely in their rate of meeting standards on the WASL when grouped by their CTE program clusters.²
6. There were no program completers in one cluster in either year: Government and Public Administration. It should be noted that jobs in this cluster compose 10.2% of Washington's economy.

² The States' Career Clusters Initiative (SCCI) is a national initiative intended to help schools organize their programs and guidance activities around clusters of similar occupations. The 16 cluster format used by the U.S. Department of Education encompasses all 970+ occupations identified by the federal labor market information system, *ONET. Sixteen clusters and curricular frameworks demonstrate for students the relationships among a wide range of career opportunities, from entry level through management and professional levels.

7. The greatest changes in CTE appeared in the number of CTE completers among programs. Although equal numbers of career clusters gained students as lost them (7 each, with 2 unchanged), many of the changes were dramatic. For example, Hospitality and Tourism, a relatively small program statewide, grew by 40%. Manufacturing, a traditional CTE mainstay, declined by 11%. Some changes were likely due to changes in course coding or program organization.³ Overall, however, the significant changes could cause very different educator perceptions of the state of CTE, depending on the program under consideration.
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9. Washington has a strong tradition of Tech Prep, enhanced by the dual credit policies of the state. Tech Prep program completion continues to rise (up 2%).
10. While students from all CTE programs had substantial student employment, rates of employment varied widely, as did college attendance. And programs differed fundamentally by how many of their students required remediation in postsecondary education, as indicated by the rates of remediation for students who completed CTE programs in various clusters.

Naturally, in the year and a half since the class of 2006 graduated, schools have continued to change. We cannot assert that the characteristics of students in these classes tell us what has happened since. We can illustrate, however, that major changes are occurring in CTE, changes that may explain why the “state” of CTE may seem troubled in some places and not in others.

CONCLUSION

Overall, CTE in Washington looks strong when viewed in the aggregate, but is clearly undergoing considerable changes in some programs and some districts. Local views may seem quite different from the state-level picture. This likely parallels the changes occurring throughout K-12 education as reform continues. The information provided here may help us know what remains strong and what needs our focused attention to ensure that CTE continues to help students prepare for the careers that lie ahead.

The evidence behind these conclusions follows.

³ CTE educators “code” their courses and programs using a federal system of numerical identifiers. When a course is adapted, or an instructor changes, one course may shift sufficiently in content to be recoded as another cluster. In this data, for example the program Business Administration grew by 45% while Retail and Wholesale Sales and Services declined by 20.3%. The business-related themes of both clusters may mean that these two clusters are shifting their relative content, reflect a new emphasis in the programs, or represent a shift in the source of business instructors.

High School Graduation and Career-Technical Education Program Completion: Evidence for the Study's Key Findings

Key Finding #1: Students leaving high school in 2006 were very similar to those who left in 2005. More students and graduates were in special education and in poverty, but the changes were small.

For this study we considered students reported by their districts as leaving school in 2005 and 2006. These “exiters” include students who graduated as the Class of 2005 and Class of 2006, respectively. Each cohort also includes students who graduated who were previously projected to be in an earlier class. These are designated “late graduates.” Those graduating early are also included. An additional group of students who left school did not graduate.

The numbers of students in all these categories did not vary much between the two years. In 2006, 71,737 students left school, 2.4% fewer than in 2005. From 2005 to 2006, the number of students graduating from high school also fell slightly, from 62,644 to 61,827, a decline of 1.3%. Since the decline in graduates was smaller than the change in those who left school for any reason, the graduation rate rose slightly (.9%).

Students who *exited* high school in 2005 and in 2006 were much alike, although the percentage of students in special education and the percentage in poverty were rising.

<i>Exited 2005</i>	<i>Exited 2006</i>
Total: 73,486	71,737
49% female (36,235); 51% male (37,251)	49.6% female (35,577); 50.4% male (36,160)
24.7% low income	27.2% low income
7.2% special education	8.0% special education
3.2% English-Language Learners (ELL)	3.5% ELL
24.7% SOC (in poverty)	27.2% SOC

Students who *graduated* in 2005 and 2006 were also very similar. In 2005, 73,486 students left school. 85.3% of them graduated, although that number includes students who should have graduated in earlier years. 93.5% of those who graduated did so “on time” (which includes early graduation.)

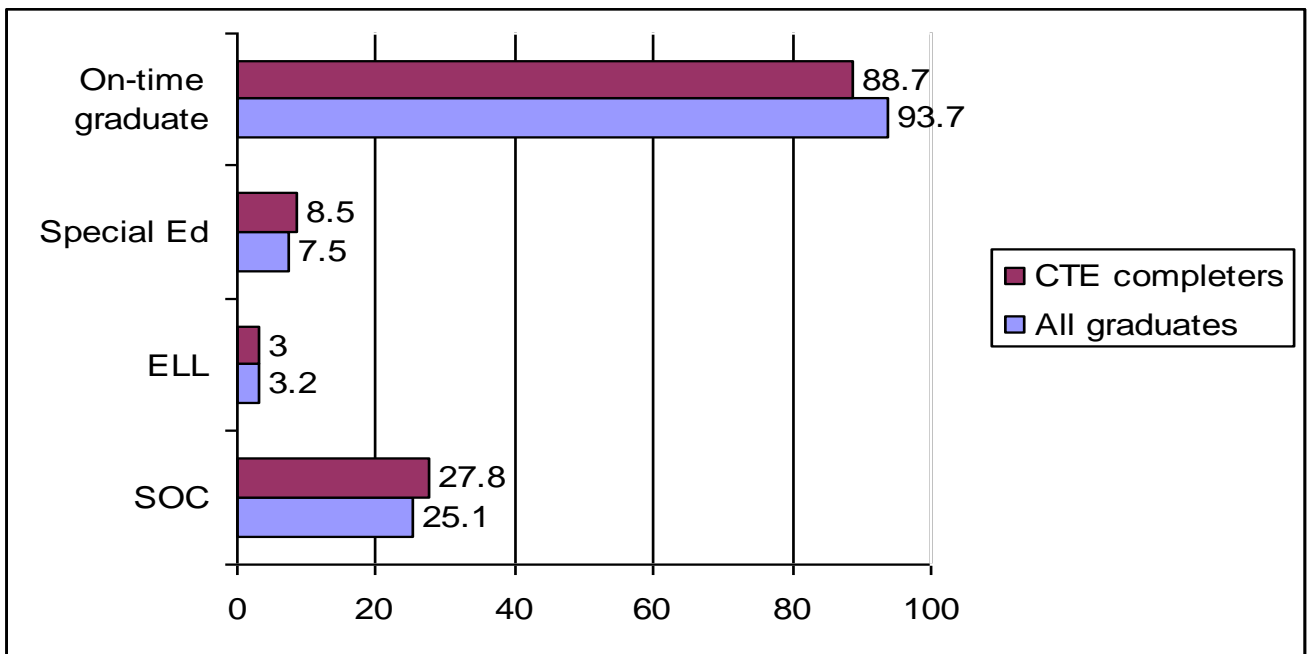
62,644 Graduated in 2005	61,827 Graduated in 2006
○ 85.3% of exiters	○ 86.2% of exiters;
○ 93.5% were on-time graduates	○ 93.7% on time
50.9% female; 49.1% male	50.8% female; 49.2% male

○ 88% of exiting females graduated	○ 88.3% females graduated
○ 82.6% of exiting males graduated	○ 84.1% males graduated
23.5% low income	25.1% low income
6.6% special education	7.5% special education
3.1% English language learners	3.2% English language learners
23.5% SOC	25.1% SOC

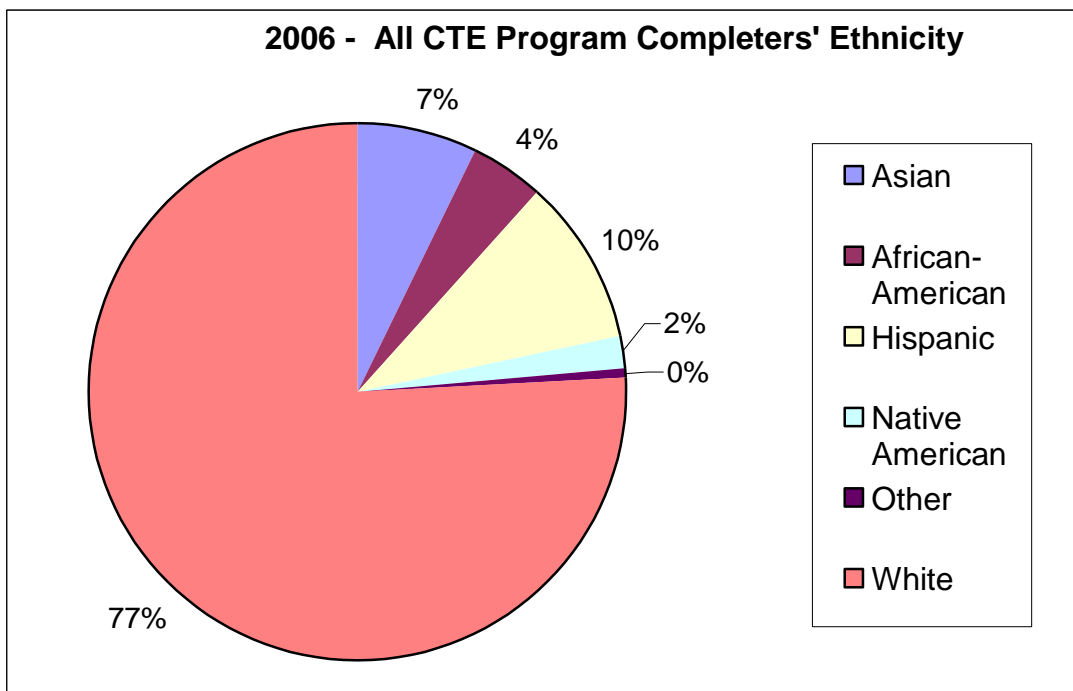
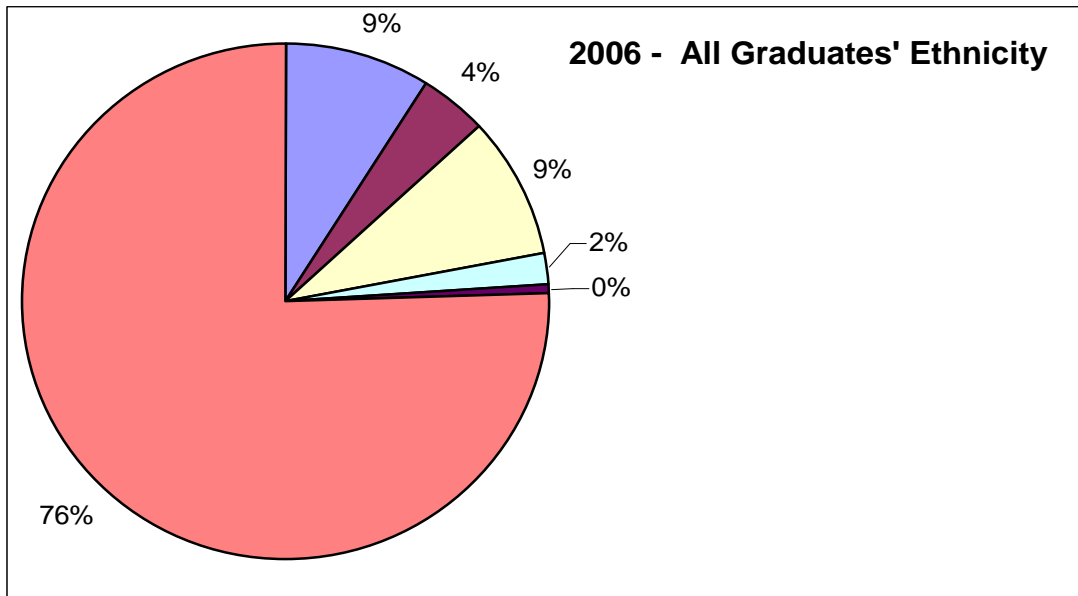
The rate of poverty was rising in all classifications of students from 2005-2006. The rate of poverty among all groups – exiting students, graduates, CTE completers and CTE completers and graduates all grew between the two years.

Key Finding #2: Overall, the general characteristics of CTE completers largely matched those of all students. One exception was that CTE completers were slightly less likely to graduate on time (88.7% of CTE completers graduated on time vs. 93.7% of non CTE completers).

Another difference was that among CTE completers, there was a slightly higher proportion of students from special education and students in poverty, and a slightly lower percentage of Asian and female students.

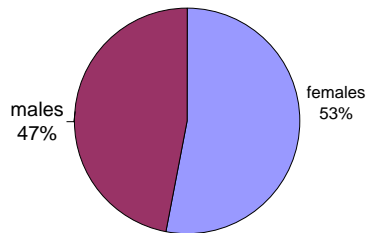


CTE Completers' ethnicity nearly matched the greater student population, but there was a 2% under-representation of Asian students and a 1% over-representation of both whites and Hispanics.

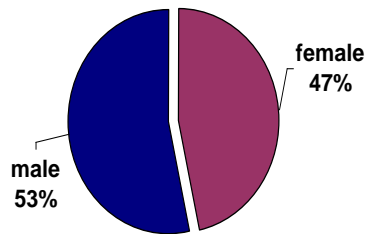


The greatest disparity was in gender. In both years there were slightly more boys than girls exiting high school, yet more girls graduated in each year. (The rate of graduation by males was increasing, however. From 2005 to 2006, the proportion of exiters who graduated increased by 0.9%, while the rate of graduation among males increased by 1.5%.) At the same time, the proportion of female to male CTE completers remained at 53% male to 47% female. For students who both completed a CTE program and graduated, the proportion was 52% male to 48% female.

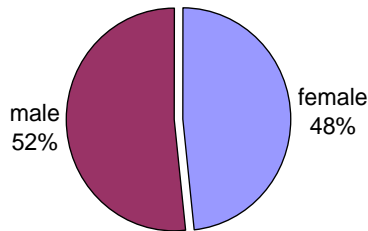
2006 High School Graduates



2006 CTE Program Completers

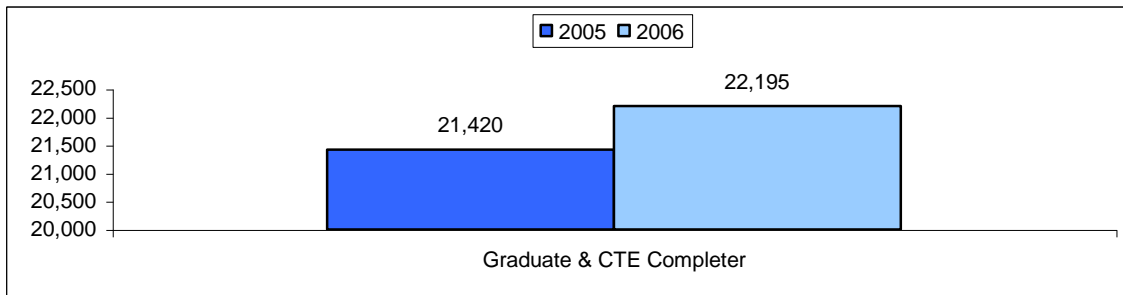


2006 CTE Program Completer/Graduates



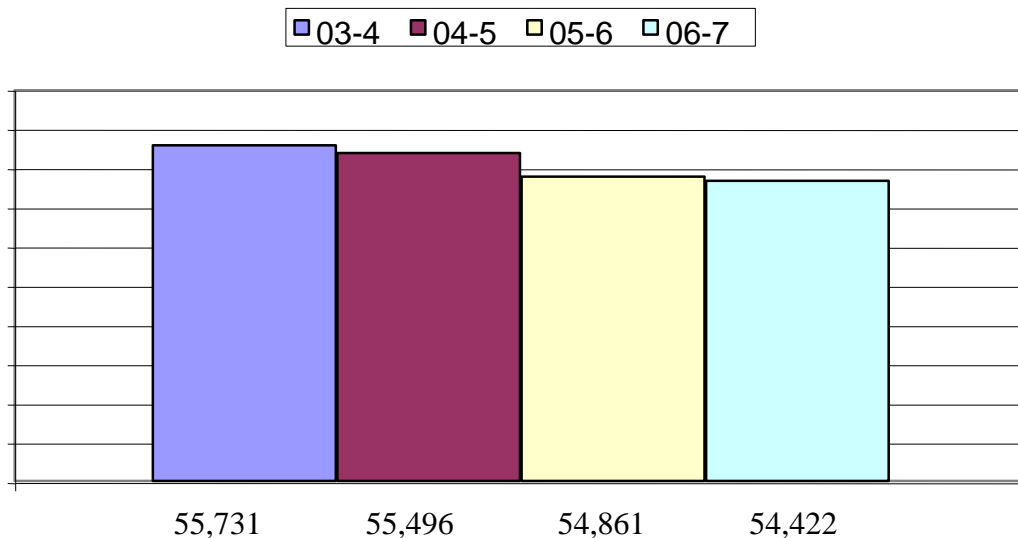
Key Finding #3: The graduation rate rose by 0.9% in 2006, but CTE completers increased by 1.5%. CTE completers who were also graduates increased by 3.6% and their proportion of all students leaving school increased by 1.9%. Statewide, CTE enrollment declined in the years studied (2005 and 2006).

	2005	2006	Change
CTE Completers	23185	23765	
Non-CTE Completers	50301	47972	
	31.6%	33.1%	+1.5%



Growth of Graduates who were also CTE completers: 3.6%

At the same time, however, total CTE enrollments declined, continuing a general decline that can be traced from 2004. The numbers below combine the full-time equivalency (FTE) enrollments for CTE programs in comprehensive high schools, in Skill Centers, and include Skill Centers' summer school enrollments, too. The total decline is 1,519 FTE or 2.5% since 2004.



Key Finding #4: CTE completers' schools were slightly more often urban and slightly less often rural than their peers.

Little changed from 2005 – 2006 regarding the kind of schools students were attending.

In 2005	In 2006
62.1% graduates were from urban districts; 37.9% from rural districts	62.2% came from urban districts; 37.8% from rural districts
64.5% CTE completers came from urban districts	64.5% CTE completers came from urban districts

In 2005, only 16.5% of the graduates came from districts in which 50% or more of the students were poor. As might be expected, students graduated at higher rates from districts with lower poverty:

- 90.7% of students graduated from districts in which 24% or fewer of the students were poor
- 81.6% of students graduated from districts in which 75% or more of the students were poor.

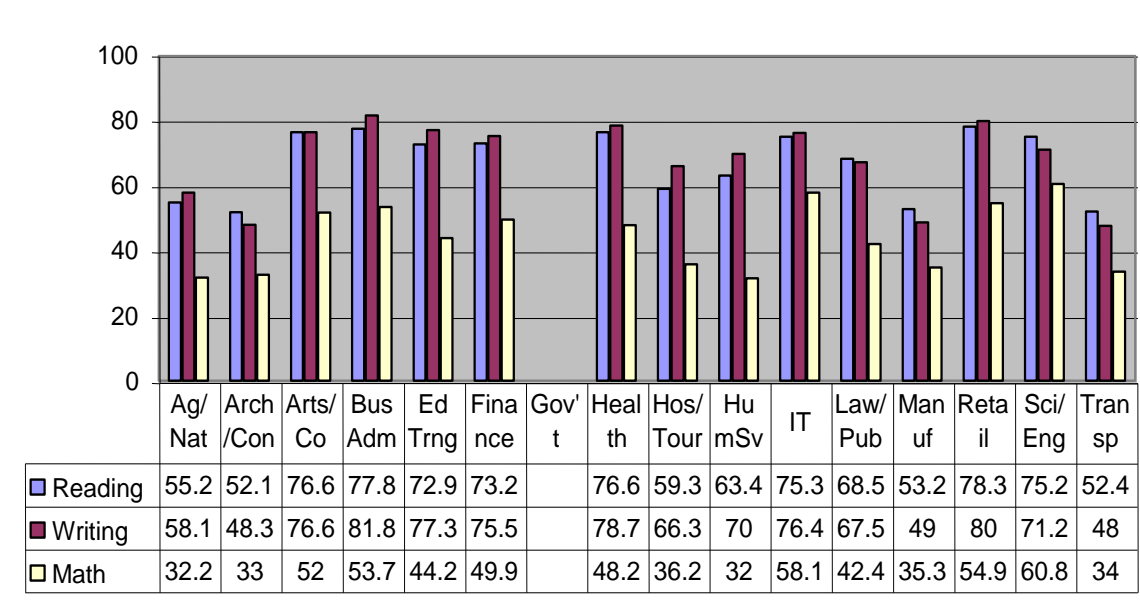
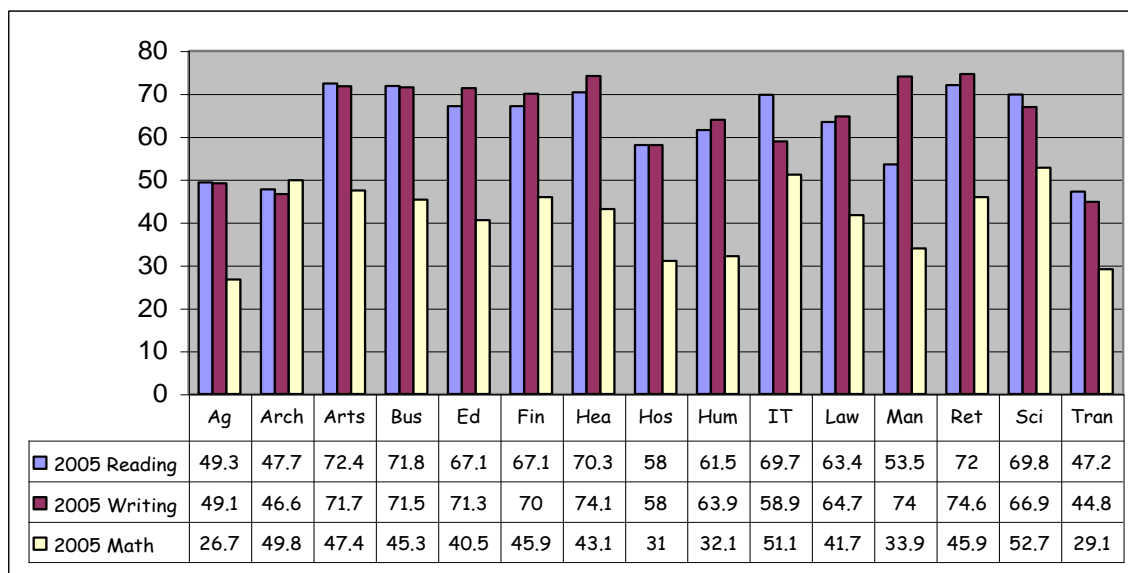
In 2006, the graduation rate in the districts with 75% or more students grew notably to 85.7%, but still did not equal the rate in the districts with fewest poor students (which remained at 90.7%).

Key Finding #5: CTE completers also varied widely in their rate of meeting standards on the WASL when grouped by their CTE program clusters.

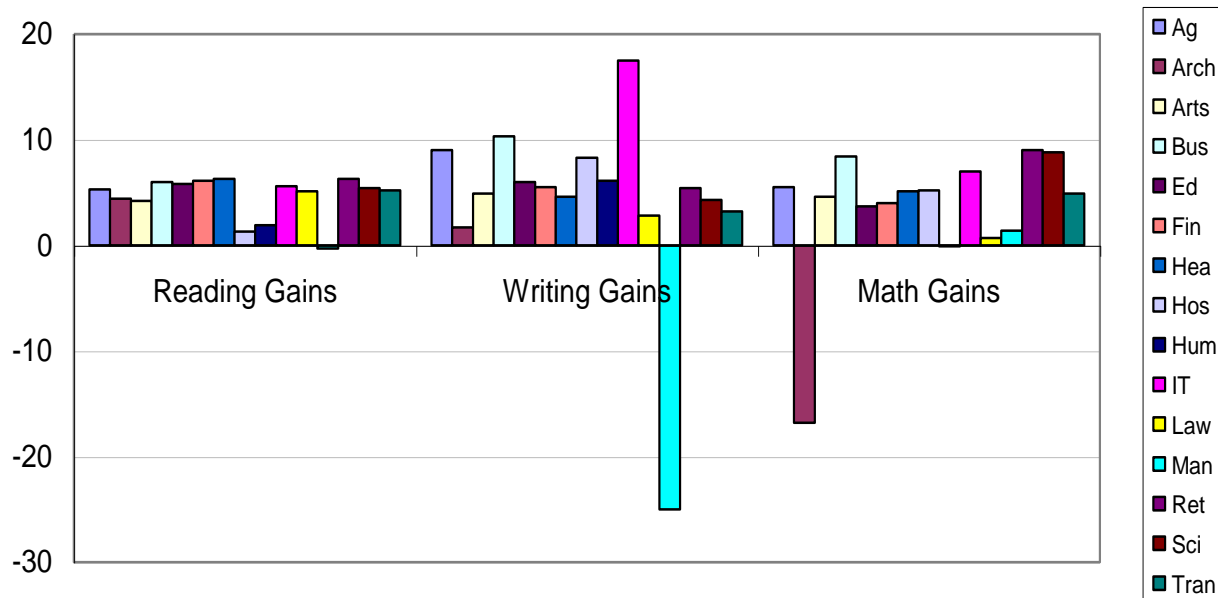
The table below shows the proportion of CTE completers/graduates who met each of the three 10th grade WASLs.

	Males	Females
Met Reading Standard	64.8%	73.5%
Met Writing Standard	62.1%	79.7%
Met Math Standard	47.7%	59.6%

Here are the percentage of students who passed each WASL in 2005 and 2006 by the cluster in which they completed a CTE program:



And here's the comparison, by percentage of gain and loss:



Key Finding #6: There were no CTE completers in one career cluster in either year: Government and Public Administration.

Jobs in Government and Public Administration account for 10.2% of the Washington economy. They include occupations in government administration at all levels, including delivery of public services, budget and legislative analysis, and both elected and appointed positions. They also include many military occupations.

Key Finding #7: The greatest changes in CTE appeared in the number of students who completed programs in each career cluster. Although equal numbers of career clusters gained students as lost them (7 each, with 2 unchanged), many of the changes were dramatic. For example, Hospitality and Tourism, a relatively small program statewide, grew by 40%. Manufacturing, a traditional CTE mainstay, declined by 11%. Some changes were likely due to changes in course coding or program organization.⁴ Overall, however, the significant changes could cause very different educator perceptions of the “state” of CTE, depending on the program under consideration.

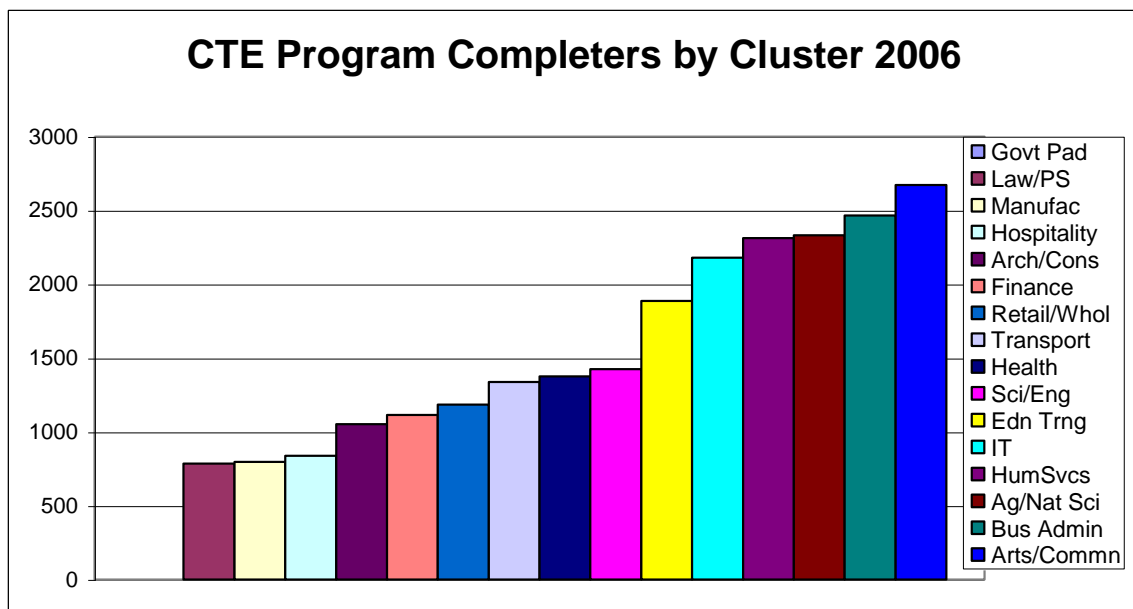
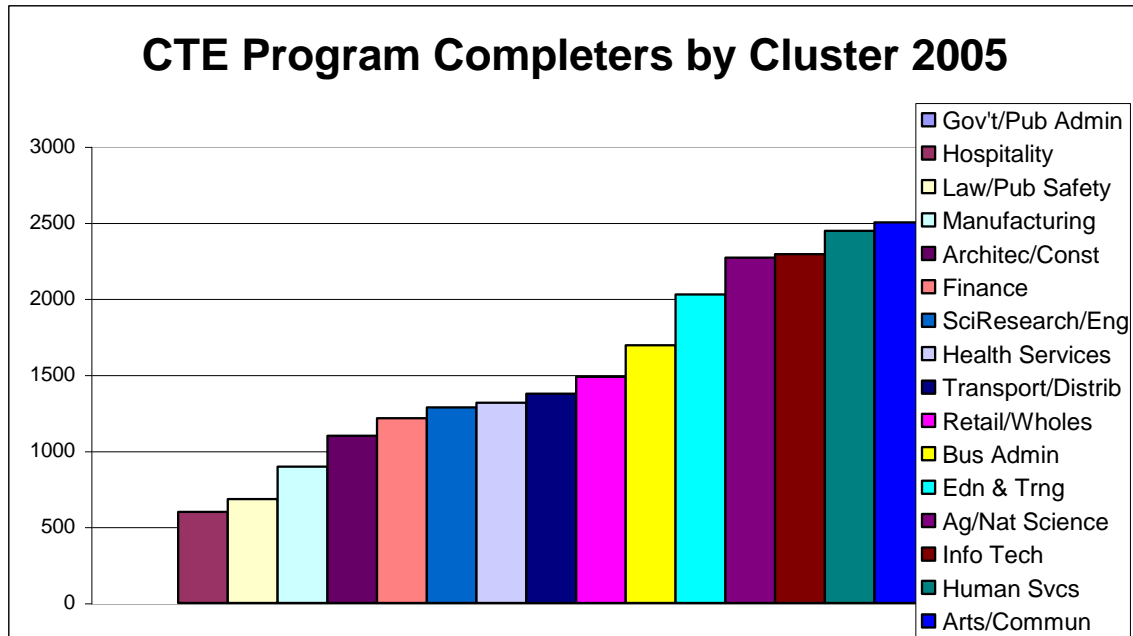
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High school graduates who completed CTE programs increased from 2005 to 2006, but the career clusters in which they studied changed, sometimes dramatically. For example, from 2005 to 2006 high school graduates in the Agriculture pathway rose by 3%; the Architecture and Construction cluster declined by 1.7%. Transportation and Logistics saw virtually no change. Overall, seven clusters increased, seven declined and two had no changes.

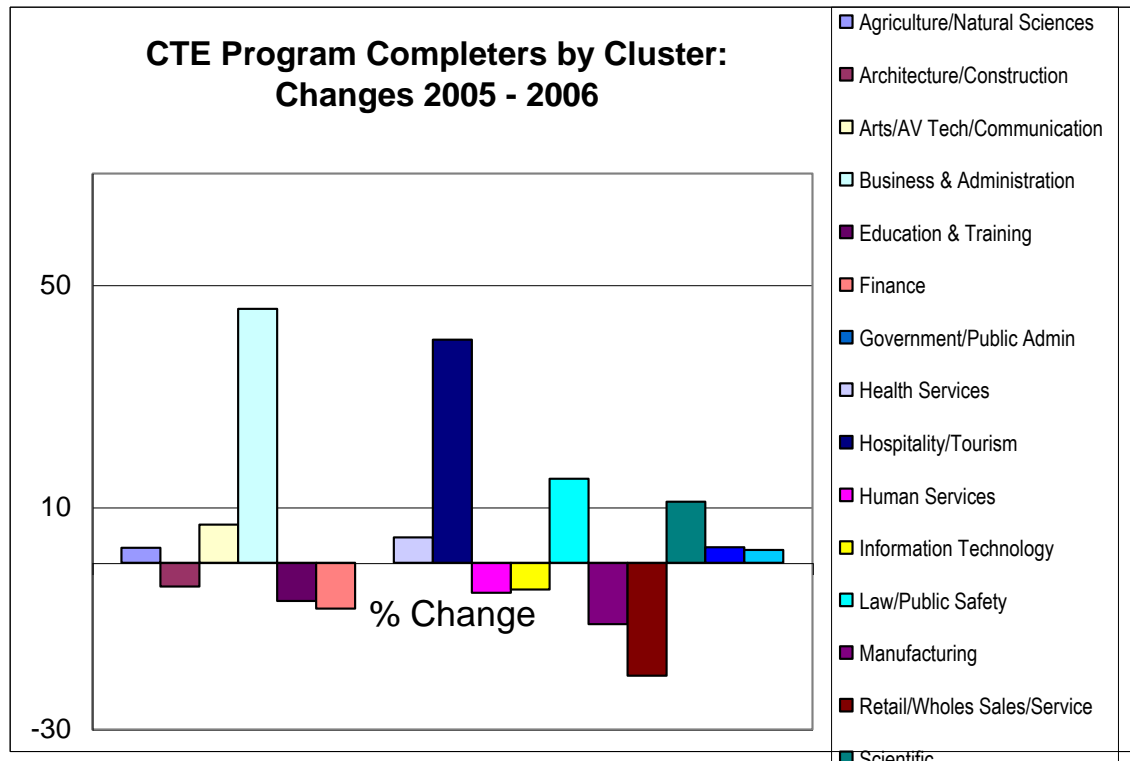
The largest changes occurred in Business Administration, which had 46.7% more high school graduates (from 1,601 in 2005 to 2,348 in 2006). Similarly, the Hospitality and Tourism pathway, though small in total enrollments (555 graduates in 2005) nonetheless increased by 41% (783 graduates in 2006). Notable growth also occurred in Arts/AV Technology, and Communications pathways, up 6.5%.

Completers by Cluster						
			2005	2006	Change	% Change
Agriculture/Natural Sciences			2270	2331	61	2.69
Architecture/Construction			1100	1053	-47	-4.27
Arts/AV Tech/Communication			2502	2673	171	6.83
Business & Administration			1693	2466	773	45.66
Education & Training			2028	1888	-140	-6.90
Finance			1214	1114	-100	-8.24
Government/Public Admin			0	0	0	0.00
Health Services			1316	1376	60	4.56
Hospitality/Tourism			598	838	240	40.13
Human Services			2445	2313	-132	-5.40
Information Technology			2292	2181	-111	-4.84
Law/Public Safety			683	786	103	15.08
Manufacturing			896	797	-99	-11.05
Retail/Wholes Sales/Service			1487	1185	-302	-20.31
Scientific Research/Engineering			1285	1426	141	10.97
Transportation/Distrib/Logistics			1376	1338	-38	2.76
TOTAL CHANGES			25190	25771	580	2.30

Here are the clusters of the CTE completers in 2005 and 2006:



And here are the changes from 2005 – 2006:



Students who complete CTE programs have invested at least 360 hours in their technical studies. For many students in a comprehensive high school, that means four ninety-hour courses. (For a Skill Center student it means more hours. A Skill Center program is generally 540 hours.) We don't know how many hours are spent in career exploration, compared to the hours in preparatory courses. That information can be derived from work with specific course titles and district records, but it is not available statewide currently.

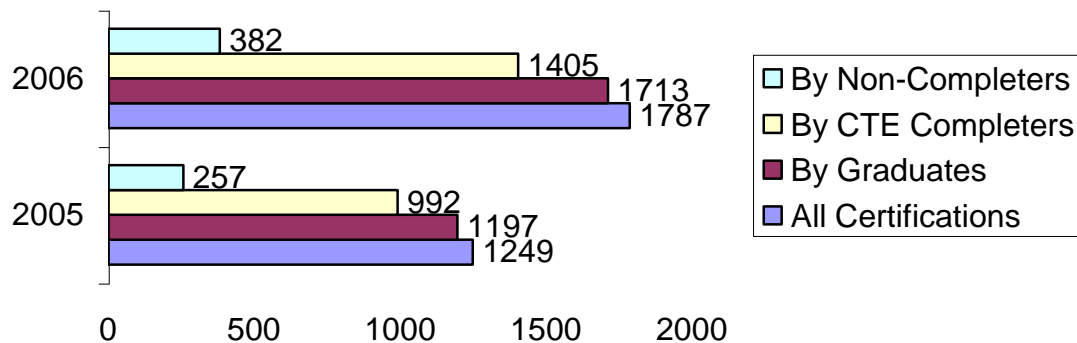
This investment of student hours needs to correlate with successful outcomes for the student, although that can be defined in several ways. One is the achievement of an industry certification.

Key Finding #8: The number students earning industry certifications increased substantially (up 43.7%). Interestingly, the proportion of students earning industry certifications without completing a CTE program increased at an even greater rate.

While only 1.9% of high school graduates earned industry certifications in 2005, the number increased by 43% to 1,713 in 2006, so that 2.7% of all high school students graduated with an industry certification.

This number is low, but reflects a conservative attitude toward certification in Washington. Rather than anoint local certifications, generally used to signify program or course completion, Washington only records industry certifications that are, indeed, recognized by an industry. Thus, completion of a keyboarding class does not earn skill

certification, even though it may represent an important skill for employment (and for school.) Award of a Microsoft Office Specialist (MOS) credential does qualify.



Note that both the number of industry certifications earned by non-CTE completers increased by 48.6%.

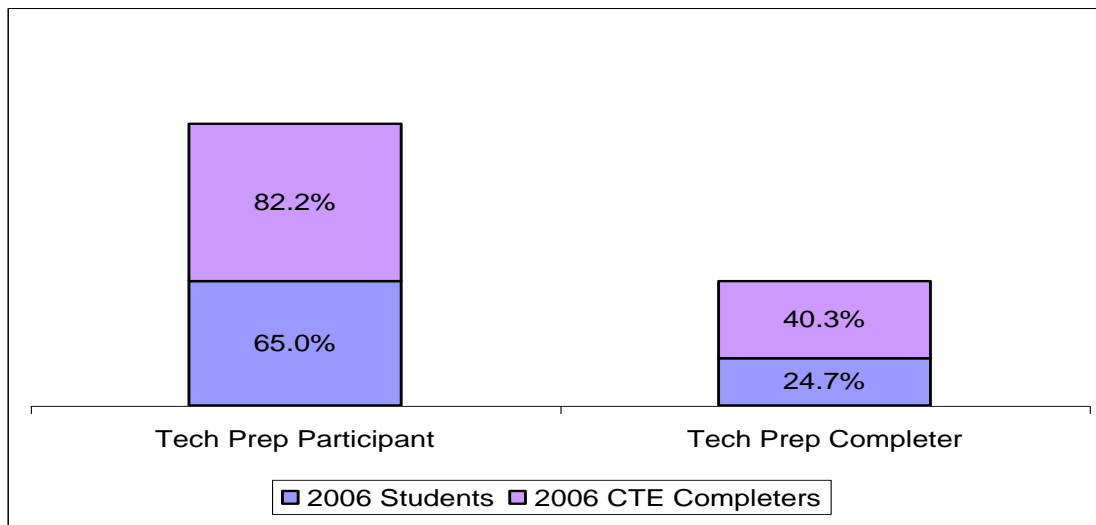
Key Finding #9: Washington has a strong tradition of Tech Prep, enhanced by the dual credit policies of the state. Tech Prep program completion continues to rise (up 2%)

Another measure of success for CTE program completers can be completion of a Tech Prep program. Originally designed as a program to encourage articulation between secondary and postsecondary technical instruction, Tech Prep was called the 2+2 program. Students were intended to take two years of secondary technical education and transition directly into a further two years of postsecondary technical education. The federal government provides funding to support Tech Prep through the Perkins Act. That support effectively eliminates the need for Running Start funding for most dual credit technical education courses.

In fact, Tech Prep rapidly evolved in Washington because of the rise of dual credit options. This allowed Tech Prep to “collapse” the time sequence and offer students the ability to take college-credit course work before high school graduation. In 2003-2004, 13,690 Washington State high school students earned 86,189 college credits through Tech Prep. That is an average of over six credits per student, for an estimated average savings to Washington families of \$4.6 million in tuition.

The definitions of Tech Prep programs and CTE programs are not completely aligned. To qualify as Tech Prep, a CTE program must have an articulation agreement with a postsecondary institution for the granting of postsecondary credit and the students must earn a B or better in the course. Completion of the Tech Prep program does not necessarily equate to the 360 hour completer definition. As a result, it is possible to complete a Tech Prep program without completing a CTE program.

Here is how the two programs intersected for students in 2006:



Tech Prep remains a very popular option for students. As noted earlier, from 2005 to 2006, the number of students graduating from high school declined by 1.3%. At the same time, the number of students participating in Tech Prep fell by .7%, yet the number of students completing the high school portion of Tech Prep programs actually rose by 2% (from 16,486 in 2005 to 16,828 in 2006.)

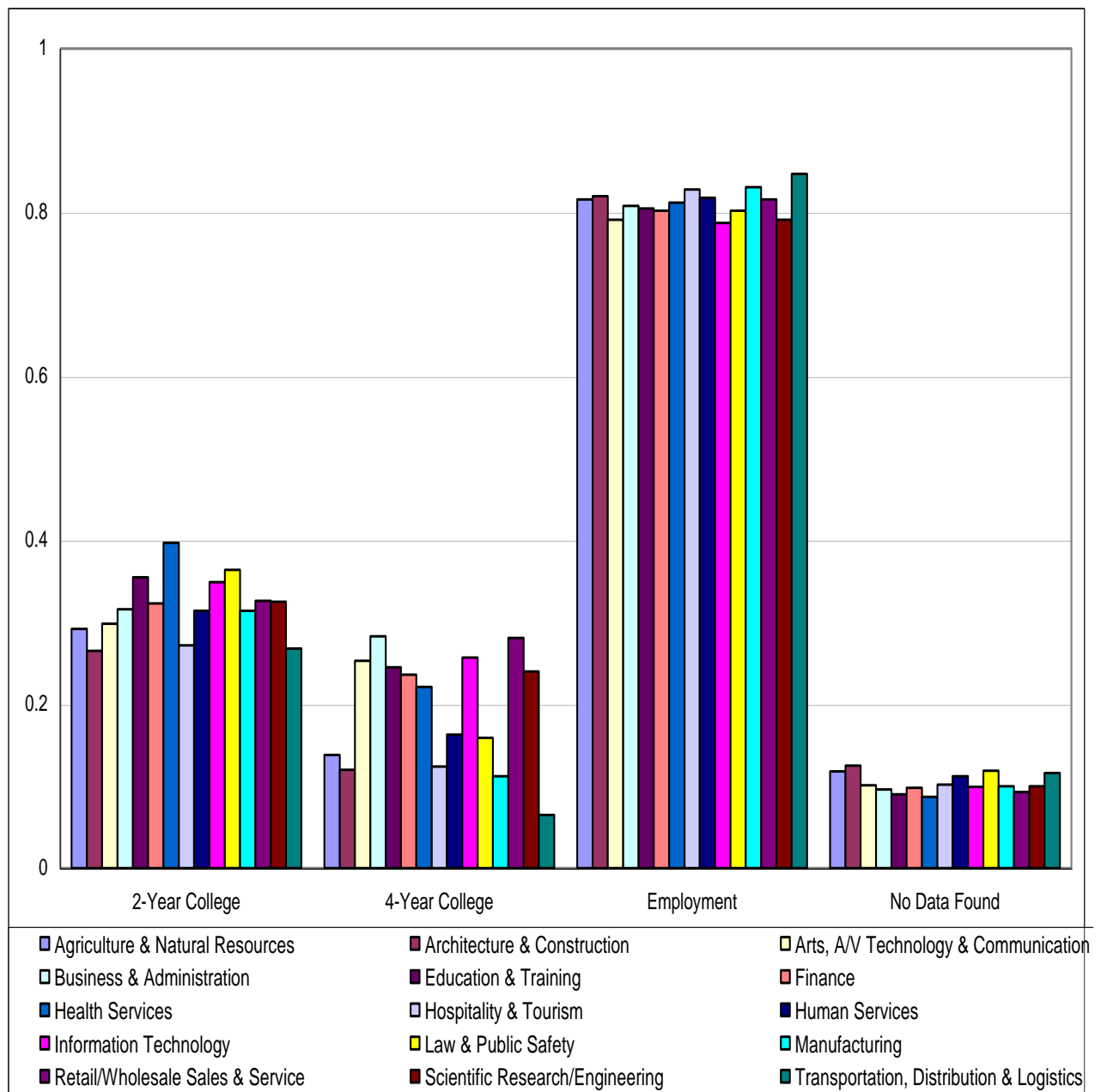
Key Finding #10: While all CTE programs had strong outcomes for student employment, rates of employment varied widely, as did college attendance. And programs differed fundamentally by how many of their students required remediation in postsecondary education, as indicated by the rates of remediation for students who completed CTE programs in various clusters.⁵

Another measure of success for a CTE program completer would be preparation for postsecondary education. Many students find their preparation inadequate once they arrive at college, and take remedial, pre-college level math or English courses. Remediation rates for non-CTE students are also substantial. The various clusters varied widely in the remedial rates of their CTE program completers; however, this reflects - CTE students' preparation across all their courses, not just their CTE program.

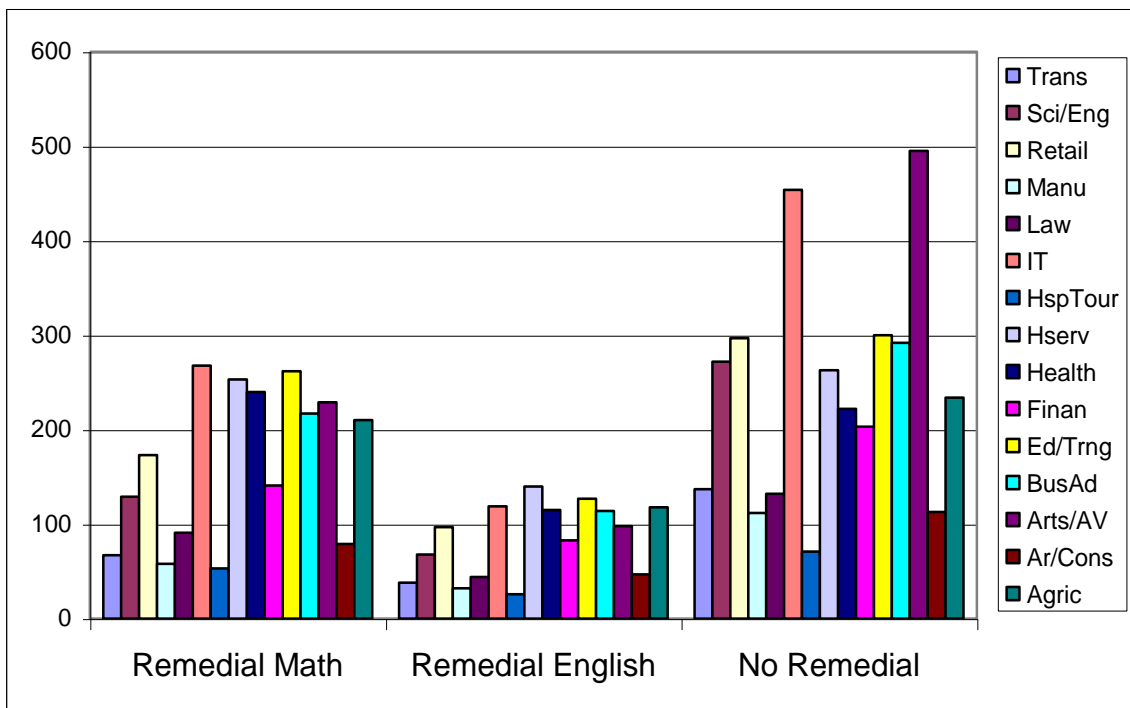
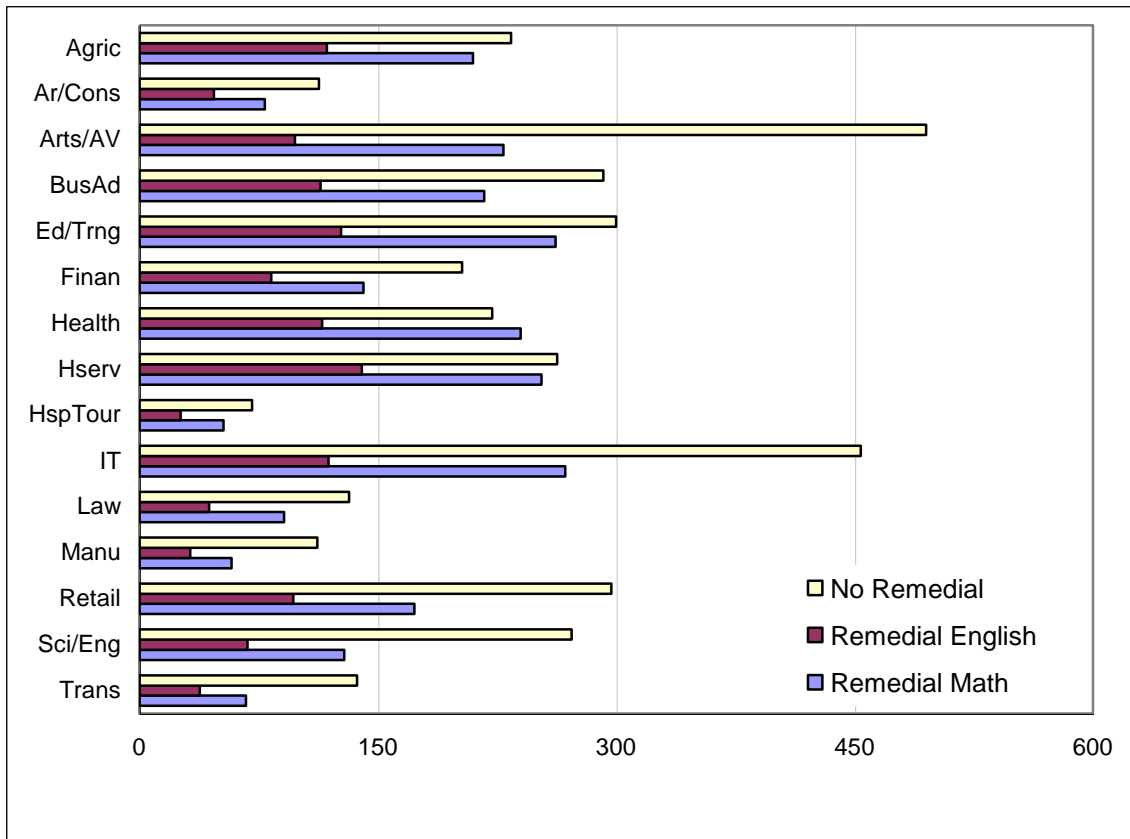
Students from the 2005 cohort who completed CTE programs continued on to both 2-year and 4-year colleges, as well as to employment. The rates of employment are high, and include those who are working and attending college.

⁵ As noted earlier, for students leaving in 2005, data was available on work or college after high school, and on remedial courses among those in college. These findings pertain only to those students. This follow-up also requires use of the student's Social Security Number. Approximately 60% of CTE completer files contain the SSN.

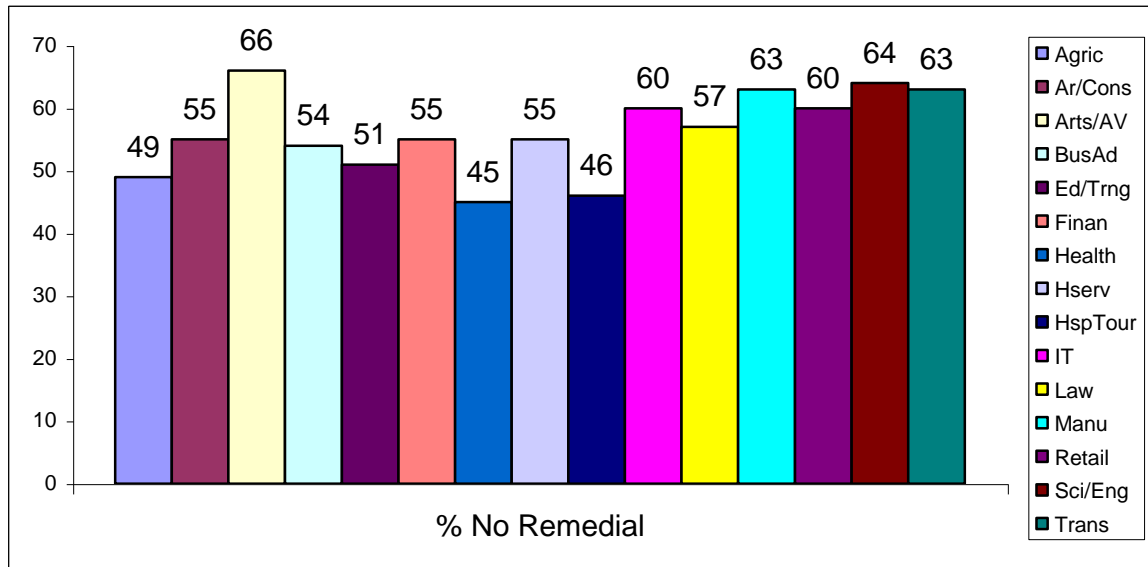
The charts below are of the numbers of students enrolled in 2-year and/or 4-year colleges and employed.



Among those who attend colleges one of the most available measures of preparation is the extent to which students seek remedial or pre-college courses before moving on to courses which earn college credit. The graphs below represent the number of CTE program completers who were required to take remediation in English or math – or not – by cluster:



And for a closer view, what percentage of students in each cluster required no remediation in college?



CAREER AND TECHNICAL EDUCATION: A BRIEF HISTORY

BACKGROUND

While apprenticeship and trades education are centuries old, American commitment to public vocational education arose largely from the economic upheavals of the 1890s-1910s. By the 1920s the federal government was committed to supporting youth and adult training for the increasingly industrial and urban economy. Although funding varied, federal, state and local education entities established an effective preparatory model that worked for decades.

Three strong traditions from that era remain today. One is the close alignment of coursework to the needs of industry. While courses today rarely are direct preparation for one employer or a single kind of job, they still are informed by committees of industry representatives who help educators know what skills are in demand and necessary for success in the workplace. These panels help insure that CTE programs evolve regularly with changes in industry.

Another tradition is the industry experience of the CTE educator. Today most CTE instructors attend college and earn a teaching certificate with an endorsement in a CTE field. A smaller percentage of CTE educators come directly from industry, assisted by specialized instruction in education. All CTE educators, however, must demonstrate substantial experience in the industry about which they will teach. This combination of industry-experienced instructors and industry advisory committees insures that CTE students are preparing for the workplaces they will actually enter.

A third “tradition” is the mixed funding that characterizes most states’ CTE programs. The methods by which states fund and manage CTE programs vary widely, but nearly all local programs are actually a mix of federal, state and local school funding. This tradition carries on, with varying investments at each level, and varying total funding.

These traditions, and the federal commitment to CTE remained strong even amid burgeoning demand for college preparation after World War II. Jobs were plentiful, skilled workers in demand, and federal and state investment in education expanded regularly. After the economic dislocations of the 1970s and 1980s, however, educators recognized a rising demand for more skills of all kinds: higher academic and new technical skills were both needed. The education reform movements of the 1990s reflected both goals. Washington’s own education reform initiative made student understanding of and preparation for work one of its four goals.

Consequently, at the same time that Washington launched an effort to increase students’ academic skills, it also engaged in a redesign of its vocational education programs. Like other states, Washington chose to clarify two main (and traditional) goals of vocational

education: career guidance and technical skill preparation. Washington adopted the new designation of “Career and Technical Education,” believed by vocational educators to better identify the purposes of vocational education. It created new program standards that distinguished coursework intended to help students become aware of careers (“exploratory” CTE courses) from those focused on industry-specific skill acquisition (“preparatory”). Working with postsecondary partners, educators and industry partners, CTE educators developed pathways of exploration and preparation leading directly to postsecondary education, training and employment.

Washington also updated its rules for work-based learning (WBL), an element of CTE that has long served students focused on post-high school employment, including special needs students. WBL includes short-term activities for students, such as job shadowing and other career exploration activities, but it culminates in rigorous internships that are crucial to many careers.

Funding CTE in Washington

Strong CTE programs provide students opportunities to explore careers, especially through off-campus job shadows and by arranging career mentors. They provide instruction in state-of-the-art practices of industries that utilize high tech – and expensive – equipment. And they arrange internships and other workplace experiences that support students’ preparation for entry into postsecondary employment, further training or college. These extra costs require additional financial support, above the funds provided for basic academic classrooms.

Like many states, Washington uses a complex method for funding local CTE programs. The smallest investment comes from the federal government by way of the Carl Perkins Act. Federal funding is dedicated to innovation and improvement of programs. It is also allocated to states based upon their rate of students in poverty, not upon student enrollment in CTE. Perkins funds also support the Tech Prep program, an early innovation in articulating secondary-to-postsecondary transitions. (Washington’s dual credit provisions further enhance Tech Prep in this state, as discussed below.)

In Washington, Perkins funds are initially received by the Workforce Training and Education Coordinating Board (WTECB). WTECB retains administrative funds and divides the remaining administration and program funds among the secondary programs (through the Office of Superintendent of Public Instruction or OSPI) and postsecondary programs (through the State Board for Community and Technical Colleges). This business/labor/agency board determines the split of funding and conducts evaluation of the programs at the state level.

For most local CTE programs, Perkins funds account for approximately 3-4% of funding. The larger share of funding comes from the state, which provides an “enhancement” to the basic education allocation for students in courses designated as CTE by OSPI. OSPI and CTE educators together determined the standards for CTE courses. Schools apply for approval of programs designed according to the standards. OSPI provides funding

based on the student enrollment (full-time equivalency or FTE) in those courses it approves as CTE.

That is, if a course meets for one hour per day (five days a week) for the year, each student in it generates .2 FTE. (A full FTE is one student in five classes per day, each day, for the entire school year of 180 days.) A class of 20 students, then, generates 4 FTE. The school is reimbursed for that class at 4 x approximately \$4700 (\$18,800) for the basic education allocation. If the class is designated as a CTE class, then an enhancement of approximately \$800 per FTE is added (+\$3,200). (And Skill Centers have an additional allocation to reflect their higher cost of operation, approximately \$500 more per FTE.)

Finally, most districts support significant additional costs related to CTE instruction, particularly for professional development and course improvements not covered adequately by federal funds. Districts without levy funds are rarely able to provide program enhancements. This may relate directly to the proportionally smaller number of CTE programs in poorer districts, as indicated by proportionally fewer CTE students in districts with high numbers of students on the Free and Reduced Price Lunch (FRPL) program.

Skill Centers

In addition to the state funds provided for CTE in comprehensive high schools, Washington also funds the operation of ten skills centers. Skill Centers emerged to give multiple districts a cost effective means of providing expensive, high tech training opportunities. Districts formed consortia to invest in and support shared facilities. Their students generally split their day between the comprehensive high school and the Skill Center, although increasingly Skill Centers offer more basic academic courses, allowing students to reduce time-consuming and distracting travel. Currently 85 school districts participate in Skills Center consortia, and more communities are evaluating the feasibility of creating Skills Centers in new regions.

CTE Challenges

Although CTE programs offer students the opportunity to explore careers, learn in non-traditional environments, and make direct connections between their academic studies and career goals, CTE programs offer districts challenges – as does any program that requires specialized teaching staff and dedicated space, and that often seeks blocked or nontraditional time commitments. Additionally, as with other special programs, CTE classes are classified as elective courses, although, as noted earlier one credit of “occupational education” is required for graduation. (State policy specifies that students take non-elective courses in designated subjects, such as 4 credits of English and 1 credit of Washington State History. Other choices are “elective.”) As state policy and local initiatives increase the number of required courses, the time available in a student day for electives is reduced.

Additionally, CTE shares the K-12 system's struggle to maintain an adequate supply of skilled educators. As in mathematics and science, potential instructors in CTE often find themselves in high demand by industry, which offers more lucrative beginning salaries. The salary gap only widens with seniority, reducing the potential that those with extensive industry experience will be willing to invest in the education needed to qualify for teaching certification. Although there is a dedicated route to certification for applicants from business and industry, the certification limits classroom instruction to a directly related CTE course. Thus a former business person can only teach a business class – not math or science or English.

As high schools seek to accommodate the needs of students struggling to meet core academic standards, they look increasingly to flexible hiring, seeking educators who can be shared among a variety of assignments. The restrictions of some CTE instructors then become disadvantages to sustaining strong CTE programs, particularly in small schools. Further, under federal requirements of No Child Left Behind, teachers in core academic subjects are required to be “highly qualified,” one feature of which is holding at least a bachelor's degree in the academic field they teach. While Washington encourages districts to consider the academic content of CTE courses, called equivalency crediting, the “highly qualified” restriction has created doubts about cross-crediting courses taught by CTE instructors from business and industry. Although OSPI endorses recognition of the CTE instructors' suitability as a core academic instructor, the concerns of districts remain.

Finally, observers note that despite a new name and new standards, misconceptions about CTE remain. Guidance counselors, other teachers, administrators, and even parents may not think that CTE courses are rigorous or lead to bright futures. They may fear that CTE programs diminish rather than increase students' opportunities. As a result, CTE educators worry that students are advised away from CTE participation, reducing demand for their classes and resulting in district decisions to reduce support or even eliminate programs.